an output definition parser for receiving a predefined output definition, and for identifying therefrom at least one mathematical texture expression and at least one texture expression evaluation parameter associated with the at least one texture expression;

a texture expression evaluation engine in communication with the output definition parser for evaluating each said at least one texture expression in view of said at least one associated parameters to create a texture output for each said at least one texture expression; and

an output renderer in communication with the texture expression evaluation engine for rendering said defined output with each said texture output.

13. [Amended] The system as claimed in claim 12 wherein said texture output is a texture image and said texture expression evaluation parameters include a definition of an area of a rendered display for which said corresponding texture image is to be applied.

14. [Amended] The system as claimed in claim 12, wherein said texture output is an audio texture and said texture expression evaluation parameters include a time-based parameter.

On the page appended hereto entitled "Version with Markings to Show Changes Made", the Applicant includes a marked-up version of the changes made to the above-noted claims by the current amendment.

--REMARKS--

Claims 1 to 14 are presently pending in the subject patent application, and stand rejected under 35 USC 103(a) in view of the cited prior art. Specifically, the Examiner rejected claims 1 to 8, and claims 11 to 13 for being obvious in view of Barrus (US 6,058,397); and claims 9, 10 and 14 for being obvious in view of Barrus and Elliot (US 5,764,241). The Applicant has amended independent claims 1, 2, 9, 11, 12, 13 and 14 for clarification, not in response to any statutory patentability requirements set forth under 35 USC. Accordingly, as the Applicant will explain in detail below, the basis of the Examiner's claim rejections are rendered moot.

Rejection of Claims 1 to 11

Independent claim 1 of the subject patent application relates to a method of rendering a user interface. The claimed method (as amended herein) comprises the steps of:

(i) receiving a predefined output definition to be rendered;

(ii) parsing said output definition to identify at least one texture expression to be employed in said rendered output, at least one of the texture expressions comprising a mathematical expression defining a texture;

(iii) evaluating each said at least one texture expression in terms of at least one texture expression evaluation parameter defined in said output definition to obtain a texture output; and

(iv) rendering said defined output with each said texture output.

A distinguishing feature of the present invention, as defined in amended claim 1, include the use of a mathematical texture expression, as part of a predefined rendering output definition, for rendering a defined output. As recited above, the defined output is rendered by evaluating each mathematical texture expression with the corresponding texture expression evaluation parameters. None of the prior art references cited by the Examiner teach or suggest an invention including this feature.

Barrus (US 6,058,397)

Barrus relates to a 3D virtual environment creation management and delivery system which allows portions of the virtual reality environment to be accessed over a network and to be modified without affecting other environment portions. The environment management system comprises a server in communication with one or more graphics work stations over a network. The server includes various tables, texture files and sound files for rendering a 3D multi-media work on the work stations. The key advantage of the environment management system is its ability to provide each work station with rendering data in accordance with the graphics rendering capabilities of the respective work station.

As the patentee discloses at column 7, line 56 to column 10, line 34 of the patent, an image includes one or more models (eg. a house, a table), each comprising one or more polygons and one or more texture maps. Each texture map comprises a number of texture images (stored in, for example, TIFF, GIF or JPEG format), with each image being rendered using a different number of bits/pixel.

As the patentee discloses at column 13, lines 22 to 60, the environment management system includes a database comprising a Locale Info table, a Locale Neighbours table, a Composition List table, a Node List table, and a Parts List table. The Locale Info table contains information about a single section (a "locale") of the virtual environment. The Locale Neighbours table defines the relationships between locals. The Composition List table identifies all the object in a given locale. The Parts List table identifies on or more primitives (eg. audio files, polygons) defining a particular object. The Node List table defines each object from the primitives defined in the Parts List table. The environment management system also includes a Texture table which, as shown in Figs. 12 and 18 of the patent, contains information regarding each texture map (eg. image file name and image resolution).

To render an image on a work station, the work station requests 3D information about a particular locale defined in the server's database, and provides the server with information regarding the work station's graphics capabilities. As the patentee discloses at column 19, line 47 to column 20, line 3 of the patent, the server obtains from the Local Info table the Locale ID number associated with the requested locale. Using the Locale ID number, the server extracts the object, node and primitive information from the Composition List table, the Node List table, and the Parts List table, and then transmits the extracted information to the work station over the network.

Using the Primitive ID number (extracted from the Parts List table), and the graphics capability information received from the work station, the server searches the Texture table for a texture map having the specified resolution attributes. At the patentee discloses at column 20, lines 25

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to 47 of the patent, once an exact or close match is located, the patentee server transmits the "image data" to the work station.

The patentee fails to define the phrase "image data" in the patent specification. However, Fig. 18 of the patent specifically depicts a Texture table entry naming a texture file ("oakqrtrt.jpg"). Nowhere in the patent specification does the patentee disclose a Texture table which includes an equation or function defining a required texture. Further, the patentee fails to describe any unique texture equation processing capabilities of the work station, but only states that the work station has a browser configured with a VRML browser plug-in. VRML (Virtual Reality Markup Language) does not define a texture using an equation, but instead relies on a URL to locate an image file. Consequently, the term "image data", as used by the patentee, can only be construed as consisting of a pointer to an image file.

From the foregoing description, it will be apparent that the invention recited in amended claim 1 of the subject patent application differs from the 3D virtual environment creation management and delivery system taught by Barrus in that the 3D image is not rendered by transmitting to a renderer a mathematical texture expression, as in the invention recited in amended claim 1, but instead is rendered by transmitting to the renderer a pointer to an image file. Consequently, the invention recited in amended claim 1 of the subject patent application is not anticipated by Barrus.

The Applicant also submits that the invention recited in amended claim 1 of the subject patent application is not obvious in light of Barrus. The Applicant notes that the Examiner stated that "it would have been obvious to one of ordinary skill in the art at the time of the invention to use the disclosure of Barrus because he teaches storing primitives as matrices and applying one of multiple corresponding texture maps to each primitive". This line of reasoning cannot be used to properly form the basis of a prima facie obviousness rejection. Rather, for a modification to a prior art reference to properly form the basis of a prima facie obviousness rejection, there must

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be some suggestion in the prior art for the modification. As the Applicant discusses below, the required suggestion is lacking.

As discussed above, amended claim 1 of the subject patent application recites the steps of parsing an output definition to identify at least one texture expression, where at least one of the texture expressions comprises a mathematical expression defining a texture, and evaluating each texture expression in terms of at least one texture expression evaluation parameter defined in the output definition to obtain a texture output. In contrast, although Barrus teaches the step of providing a renderer with "image data", Barrus only discloses that the "image data" is a pointer to an image file located across a network. Similarly, as Elliott discloses at column 46, line 64 to column 47, line 20 of the Elliot patent, Elliot models interactive animation with time varying and reactive behaviour by allowing objects to be defined, for example, with reference to a pre-existing GIF file. None of the other patent references cited by the Examiner suggest the use of a mathematical equation for generating texture data. Consequently, the suggestion in the prior art for the modification of the 3D virtual environment creation management and delivery system taught by Barrus to include a mathematical texture expression is lacking.

In addition, not only is the suggestion in the prior art for the modification of Barrus entirely lacking, but Barrus teaches away from the claimed invention. As discussed above, Barrus teaches a 3D virtual environment creation management and delivery system which uses VRML pointers to image files located across a network to facilitate creation and delivery of the 3D virtual environment. This methodology is particularly advantageous if the image renderer has already received and cached the VRML file, since it allows the author of the 3D environment to alter the environment without requiring the image renderer to download a new VRML file. Further, this methodology allows the author to take advantage of conventional image files or image authoring tools for creating the 3D virtual environment.

On the other hand, by utilizing a mathematical texture expression for creating the 3D virtual environment, the author could not alter an image to be rendered without first determining the

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appropriate mathematical texture expressions and then providing the new texture expressions to the image renderer. Since the use of mathematical texture expressions would make creation and alteration of the 3D virtual environment more cumbersome, a person of ordinary skill faced with the problem of easily conveying texture information to an image renderer would be directed away by Barrus from a solution which required the use of pre-defined mathematical texture expressions included with an output definition.

Further, the major difficulties in providing 3D rendering over a network relate to network bandwidth limitations and load limitations of the rendering server. The conventional mechanisms for addressing these difficulties, such as VRML authoring techniques, provide the renderer with pointers to texture information. The conventional mechanisms for addressing these difficulties do not suggest providing the renderer with pre-defined mathematical texture expressions included with an output definition due to the difficulty pre-defined texture expressions would create for rapidly re-defining the 3D environment. Consequently, the prior art would not direct a skilled person to a solution which required the use of pre-defined mathematical texture expressions included with an output definition, but instead would direct such a skilled person to a solution which made use of pre-existing texture files and texture file pointers.

The Applicant also points out that not only does a prima facie obviousness rejection require there be a suggestion in the prior art for a modification to a prior art reference, but also the modification must not destroy the intended purpose of the reference. As the Applicant discusses below, the required modification would destroy the intended purpose of Barrus.

As Barrus explains, the key advantage of the environment management system is its ability to provide each work station with rendering data in accordance with the graphics rendering capabilities of the respective work station. As discussed above, to provide this flexibility, Barrus searches the Texture table for a texture map which matches the resolution attributes specified by

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the graphics workstation. Barrus discloses that the server transmits image data to the image renderer once an exact or close match is located.

As will be apparent, it is relatively easy to provide the required image data by associating predefined images with groups of predefined graphics workstation resolution attributes. However, given the number of possible graphics workstation attributes, it would be difficult to define mathematical texture expressions which define texture not only in accordance with texture expression evaluation parameters defined in the output definition, but also in accordance with graphics workstation resolution attributes. Accordingly, if Barrus were modified to make use of mathematical texture expressions rather than pointers to texture files, the ability to provide each workstation with rendering data in accordance with the graphics rendering capabilities of the respective workstation would be limited if not lost.

Summarizing the foregoing, (1) the requisite suggestion for the modification to Barrus is entirely lacking; (2) Barrus teaches away from the claimed invention; and (3) the required modification to Barrus would destroy the intended purpose of Barrus. Accordingly, the Applicant submits that the invention recited in amended claim 1 of the subject patent application is not obvious in view of Barrus, or in view of Barrus and Elliott.

As claims 2 to 11 depend from independent claim 1, the foregoing arguments apply equally to claims 2 to 11. Accordingly, the Applicant respectfully requests that the Examiner's rejection of claims 1 to 11 be withdrawn.

Rejection of Claims 12 to 14

Independent claim 12 of the subject patent application relates to a system for rendering a defined output from an output definition. The claimed system (as amended herein) comprises:

an output definition parser for receiving a predefined output definition, and for identifying therefrom at least one mathematical texture expression and at least one texture expression evaluation parameter associated with the at least one texture expression;

a texture expression evaluation engine in communication with the output definition parser for evaluating each said at least one texture expression in view of said at least one associated parameters to create a texture output for each said at least one texture expression; and

an output renderer in communication with the texture expression evaluation engine for rendering said defined output with each said texture output.

The Examiner will note that claim 12 has been amended to conform substantially to amended claim 1. In particular, amended claim 12 recites an output definition parser for identifying from a received predefined output definition at least one mathematical texture expression, and a texture expression evaluation engine for evaluating each texture expression to create a texture output for each texture expression. In view of the substantial similarity between amended claim 12 and amended claim 1, the foregoing arguments apply equally to the invention defined in amended claim 12. Accordingly, the Applicant submits that the invention recited in amended claim 12 is neither anticipated nor obviousness in view of Barrus, nor Barrus and Elliott.

As claims 13 to 14 depend from independent claim 12, the foregoing arguments apply equally to claims 13 to 14. Accordingly, the Applicant respectfully requests that the Examiner's rejection of claims 12 to 14 be withdrawn.

Favourable reconsideration of the subject patent application is respectfully requested. If any additional fees are required by any of the foregoing amendments or submissions, permission is hereby granted to debit our deposit account number 07-1750. If the Examiner wishes to discuss any aspect of this amendment, the Examiner is requested to contact the Applicant's patent agent, Mr. Robert Graham, at (416) 862-4425.

Respectfully submitted,

Robert J. Graham
Reg No. 43,430

INTELLECTUAL PROP.\274096_1
April 23, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. [Amended] A method of rendering a <u>defined</u> [user interface] output from an output definition, comprising the steps of:

   (i) receiving a predefined output definition to be rendered;

   (ii) parsing said output definition to identify at least one texture expression to be employed in said rendered output<u>, at least one of the texture expressions comprising a mathematical expression defining a texture</u>;

   (iii) evaluating each said at least one texture expression in terms of at least one [corresponding] <u>texture expression evaluation</u> parameter defined in said output definition to obtain a [corresponding] texture output; and

   (iv) rendering said <u>defined</u> output [to output the contents of said definition with said at least one corresponding] <u>with each said</u> texture output.

2. [Amended] The method of claim 1 wherein said at least one [corresponding] <u>texture expression evaluation</u> parameter comprises coordinates for pixels on a rendered display.

9. [Amended] The method of claim 8, wherein said at least one [corresponding] <u>texture expression evaluation</u> parameter is time-based.

11. [Amended] The method of claim 8, wherein said at least one [corresponding] <u>texture expression evaluation</u> parameter comprises coordinates for pixels on a rendered display.

12. [Amended] A system to render [an output] <u>a defined output</u> from [a predefined output] <u>an output</u> definition [including features to be rendered and at least one texture expression to be evaluated and employed in said rendering], comprising:

   an output definition parser [to receive said] <u>for receiving a</u> predefined output definition and [to determine said features to be rendered and said at least one texture expression]<u>, and for</u>

identifying therefrom at least one mathematical texture expression and at least one texture expression evaluation parameter associated with the at least one texture expression;

a texture expression evaluation engine in communication with the output definition parser [to accept said at least one texture expression and corresponding parameters from said output definition parser and to evaluate] for evaluating each said at least one texture expression in view of said [corresponding] at least one associated parameters to create a corresponding texture output for each said at least one texture expression; and

an output renderer in communication with the texture expression evaluation engine [receiving said features to be rendered from said output definition parser and receiving each said corresponding texture output to render] for rendering said defined output with each said [corresponding] texture output.

13. [Amended] The system as claimed in claim 12 wherein said texture output is a texture image and said [corresponding] texture expression evaluation parameters include a definition of an area of a rendered display for which said corresponding texture image is to be applied.

14. [Amended] The system as claimed in claim 12, wherein said texture output is an audio texture and said [corresponding] texture expression evaluation parameters include a time-based parameter.